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ABSTRACT

Presented at the Montgomery County (PA) Intermediate Unit Conference on Learning Disabilities in the Secondary Schools, 1975, the paper presents a review of the literature on reading problems of learning disabled secondary students. Aspects covered include identification issues in learning disabilities, models of the reading process and of learning disabilities, assessment in reading, reading characteristics of the learning disabled adolescent, and instructional strategies in reading for the learning disabled. A selected series of studies is presented, showing that most learning disabled children possess reading difficulties, the exact nature of which is not yet clear. Among the conclusions presented are that assessment techniques in reading usually lack validity, reliability, and true diagnostic value; and that reading programing is more developed on the elementary level than on the secondary level. (DLS)

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# READING PROBLEMS OF THE SECONDARY LEARNING DISABLED STUDENT[1]

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LD Series #3

Center for Innovation in Teaching the Handicapped

Indiana University

Presented at the Montgomery County Intermediate Unit Conference on Learning Disabilities in the Secondary Schools, Norristown, Pennsylvania, March, 1975.

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Learning disabled youngsters are frequently characterized in the literature as possessing reading difficulties. Yet, they need not exhibit reading problems to be designated learning disabled. Most often reading problems of the learning disabled are characterized as a symptom of a language or perceptual deficit. Reading achievement has been correlated with a number of symptoms frequently found in the learning disabled, e.g., memory problems. Although much literature exists concerning the reading achievement of the learning disabled child, the reading characteristics of the adolescent learning disabled have received little attention. Several critical issues must be attended to in any description of reading characteristics of both learning disabled adolescents and children:

(1) Criteria for the selection of learning disabled adolescents and children vary widely.

(2) Investigators who have attempted to describe the reading characteristics of learning disabled children and youth differ in their interpretation of the reading process.

(3) Assessment instruments utilized for detecting reading difficulties differ in interpretation of the reading process and also lack validity and reliability in most instances.

(4) Most of the reading characteristics ascribed to learning disabled children and adolescents are the result of clinical observations rather than rigorous empirical evidence.

## Identification Issues in Learning Disabilities

Differentiating the learning disabled (dyslexic, specific reading disabled, etc.) from those with reading difficulties has been a problem for those involved in differential diagnosis and programming (Orlando, 1973). Not all reading failure has been attributed to specific learning disabilities.

The learning disabled child who exhibits severe reading disorders is often called "dyslexic" (Critchley, 1964; Johnson & Myklebust, 1965, 1967; Isom, 1969; Money, 1962; Samuels, 1973). Literally the term means the inability to cope with symbols or words. Among characteristics ascribed to dyslexic children are perceptual-motor problems, left-right confusion, memory problems, spelling difficulties, strephosymbolia (twisted symbols), and the indication of heredity as a factor in the cause of such difficulties (Bannatyne, 1971; Critchley, 1964; Hearns, 1969; Johnson & Myklebust, 1967; Money, 1962; Shedd, 1968).

No clear evidence supports a direct relationship between dyslexia, neurological impairment, and reading failure (Howard, 1969). Indeed, the issues are confused by the lack of a clear definition of the term "dyslexic."

Satz and Sparrow (1970) discuss the problem of interpreting research studies conducted on dyslexics. They state:

> Much of our current confusion over this disorder is due to deficits in experimental design and methodology. Numerous studies have been based on heterogenous clinic samples which comprise children from socially and educationally deprived areas, many of whom have neurologic abnormalities, sensory handicaps, emotional problems or even impaired intelligence. By definition, these studies are unrepresentative of developmental dyslexia. Belmont and Birch (1966) have also criticized the use of small sample sizes, wide age ranges, and inappropriate control group. Critical reviews of these problems is presented elsewhere (Belmont & Birch, 1966, p. 18).

(See Adams, 1969, and Lerner, 1969, for a comprehensive discussion of dyslexia; Wepman et al., 1975, on the state of the art; and Sitko & Gillespie, 1975, for a more extensive discussion of definitional problems in the field of learning disabilities.)

## Models of Reading Process and Learning Disabilities

Reading educators vary immensely in interpretation of the reading process. The many different approaches to teaching reading are ample evidence.

Says Blanton (1973):

> As a primary form of information processing in literate societies, reading is one of the more complex acts performed by man. Educators have been constantly challenged to explicate the reading process and to determine how reading skill is learned; and more recently, members of related disciplines have developed an interest in reading. Consequently, a great amount of information concerning reading has accumulated. One might expect that we have an adequate theory to explain how the complex process we call reading is either acquired or functions. This is not the case, however. (p. 115)

Williams (1973) classifies past/present theories of reading models as follows: (1) taxonomic models, (2) psychometric models, (3) psychological models, (4) linguistic models, and (5) transactional models. Educators in learning disabilities appear, perhaps unwittingly, to have adopted several of these models. Of these, the taxonomic, psychometric, and psychological are prevalent in clinical and empirical evidence of reading characteristics of the learning disabled.

1. Taxonomic models. These models categorize reading skills according to word perception (pronunciation and meaning), comprehension, and assimilation of what is read through the incorporation of experiences held by the child, and information obtained from reading. Many reading tests (e.g., Gray Oral Reading Test) and programs currently used with learning disabled children and adolescents reflect components of this model.

2. Psychometric models. The psychometric model of reading is an attempt to identify variables and sub-variables that contribute to the variance in reading comprehension. Williams (1973) describes the goal of this model as determining:

> the nature of the combination of the hierarchically organized subsystems that form a working system for attaining speed and power of reading (p. 125).

A variety of tests is chosen for such an attempt. Measures of auditory and visual perception are examples. First, a set of variables is chosen

from a theory or past research. Variables that may account for most of the variance are then reanalyzed for such sub-variables as auditory discrimination and discrimination of medial sounds.

Much research has been conducted in the area of language, auditory and visual discrimination, visual and auditory memory, auditory-visual integration, and intelligence and attention in order to determine the relationship between these variables and reading achievement. (See Birch & Belmont, 1964; Johnson & Myklebust, 1967; Kass, 1963; Money, 1962; Samuels, 1973; and Satz & Friel, 1974.)

In addition, patterns of performance of brain-injured and dyslexic children on the WISC have been studied (Clements & Peters, 1962). The development of psychometric measures such as the ITPA and the Developmental Test of Visual Perception (Frostig & Horne, 1964) and the emphasis on perception, attention, memory, and other "reading correlates" comprise much of the research in reading and the learning disabled.

Although many studies attempting to define correlates of reading do not use psychometric devises, they are similar to others in that they investigate variables and sub-variables that may account for the variance in reading achievement. Such factors as experiential background, general health, visual and auditory defects, speech impairments, motor disturbances, intelligence, language skills, visual and auditory perception, perceptual-motor skills, and emotional and social adjustment have been related to reading achievement (Gillespie & Johnson, 1974). Many, if not all, of these characteristics have been found to exist in children labeled as learning disabled.

Some of these characteristics have been cited as possible causes or correlates of reading disability: poor memory (Kass, 1963); difficulty

in integration of auditory and visual stimuli (Beery, 1967; Birch & Belmont, 1964); memory factors (Ellehammer, 1967; VandeVoort & Senf, 1973); attentional deficits (Lahaderne, 1968); sequencing difficulties (McLeod, 1967); language difficulties (Myklebust, 1973); and deficient information-organization processing (Senf, 1971).

Although much research has been conducted to determine causes of reading failure, no conclusive results have yet been formulated. Moreover, many studies of reading disability include variables that have little direct connection with the reading process per se (Samuels, 1973). Samuels summarizes the shortcomings of the research:

> Despite an impressive amount of research on causes of reading retardation, the bulk of the research fails to add up to much: a) the research has been piecemeal in its approach rather than systematic; b) the matched group designs generally used in these studies were inadequate; c) the students were used for research after they had been identified as having a reading problem rather than before, thus masking what is cause and what is effect; d) numerous studies have investigated variables which are not components of a learning model of reading acquisition; e) diagnostic labels were used, implying that causes of the reading problem were known; and f) sources of unreliability in achievement expectancy formulae, reading achievement tests, and intelligence tests have resulted in invalid research results and conclusions (p. 208).

In summary, the relationship of such factors as auditory and visual discrimination, memory, perceptual, motor achievement, attention, and auditory-visual motor integration with reading achievement shows positive correlations. These correlations are generally low; therefore, they account for little of the total variance in reading achievement scores. Furthermore, the exact nature of the relationship between these reading correlates and reading achievement is not clearly delineated, though the literature is replete with attempts to explain the reading failure. (See Samuels, 1973, for a thorough discussion of this research.)

3. Psychological models. Williams characterizes the psychological

model as one that has been influenced by psychologists interested in the reading process. She places Skinner (1957), Staats, Staats, Schultz, and Wolf (1962), and Gagne (1970) in the behavioral approaches category; Gibson (1970) and Elkind (Elkind, Horn, & Schneider, 1965) in the cognitive category; and Venesky and Calfee (1970) in the information processing category.

Briefly, behavioral psychologists view reading as operant learning with the reading response attached to a specific textual cue. "The strengthening of this association occurs via the mechanism of reinforcement. . ." (Bloom, 1973, p. 149). Reinforcement includes discrimination training in that specific verbal responses are reinforced as they occur with certain visual stimuli. Shaping is an integral part of the teaching of reading and writing in this approach.

Approaches such as programmed reading and programmed tutoring have incorporated these learning principles. Materials for special populations, including the learning disabled, use discrimination learning and reinforcement (Bijou & associates, 1972; Fitzhugh & Fitzhugh, 1969; Woodcock, 1969; Woolman, 1966). The engineered classroom (Hewett, 1968) and environments established by Haring and Hauch (1969) have been used as vehicles for teaching learning disabled children to read.

According to Williams, Gibson (1970) has developed an organized interpretation of reading which combines the elements of language, i.e., phonological, semantic, and syntactic, with the distinctive features of the graphic symbols. The child learns the shapes of the letters and uses systematic scanning in an active process of comparing and selecting appropriate cues. As the child acquires more cues, s/he inductively groups them into larger units of information. These are then used in reading

larger, more efficient units such as phrases. Rules of information are correspondents between graphemic and phonemic systems, rules of orthography (structural anaylsis), grammar, and meaning. Gibson recommends training in reading be within a rule-oriented framework.

Gibson's research in the area of distinctive features of letters offers much potential for the development of instructional strategies for problem readers. In a review of visual memory of poor and good readers, Samuels (1973) concludes that the superior visual memory of a good reader is due to his/her ability to attend to distinctive features and encode them verbally. Gibson et al. (1962), Guralnick (1972), and Popp (1964) provide a means for analyzing the characteristics of letters that tend to be confusing to poor readers. Gibson's contribution to this area is unique and offers much potential for the development of instructional strategies because of her specificity of analysis of graphic forms.

Cognitive psychologist David Elkind uses a Piagetian approach. In his developmental theory, Elkind emphasizes the perceptual components of reading. The perceptual processes embody logical operation, e.g., understanding grammatical structures. As the child matures, s/he is not dependent solely upon the visual perceptual aspects of reading. Elkind stresses sensory-motor methods in remediation which facilitate the internalized actions of perceptual activities.

In general, reading instruction in learning disabilities has stressed the perceptual aspects of reading as well as sensory-motor training. Perhaps the descriptions of learning disabled children's inability in visual perceptual tasks could be explained in developmental terms: The child is attending only to perceptual rather than the cognitive tasks of reading. A summary of Piaget's views of the development of mathematical concepts

may hold true for the reading difficulties of some children:

> For Piaget, perceptions and associated images will not provide the concept of a group, because as we have seen, they are rigid, irreversible and cannot be arranged in various ways. Later, the child's thoughts will be more maneuverable or operational. . . (Lovell, 1966, p. 47).

4. Linguistic and information processing models. The information processing models called psychological models by Williams (1973) have received much attention recently. Investigators in special education (Sabatino & Hayden, 1970; Van Meel, Vlek, & Bruijil, 1970) have related information processing to reading. Such tests as the ITPA have incorporated measures for information processes, i.e., receptive, integrative, and expressive. The ability of children and adolescents classified as retarded to organize verbal input for retrieval during the act of reading has been explored by Bilsky and Evans (1970), Blanton (1974), and Evans (1970), and reviewed by Blanton, Sitko, and Gillespie (in press).

Information processing has been related directly to reading. Because many models include linguistic features, we have combined the information processing and linguistic models for the purposes of this discussion. Specifically related to information processing, Venezky and Calfee (1970) describe input and output in terms of visual scanning: The child scans for large manageable units such as phrase boundaries and then decodes (output). An integration stage of syntactic semantic features is included. Similarly, Van Meel, Vlek, and Bruijel (1970) speculate that reading problems may result from incorrect, incomplete scanning procedures. They conclude from their studies that when the complexity of visual discrimination task increases, the performance of the learning disabled children is comparatively more hampered (p. 112).

Smith (1971), a reading investigator, combines elements of language

and information processing to explain the reading process. He describes the competent reader as one who tests features that extend beyond the discrete visual features of the printed material. A reader need not attend to all the visual features; rather, the child must combine visual configuration and context. Syntactic and semantic redundancy existing within word sequences is used to glean meaning. The reader moves directly from visual features to meaning by simultaneously combining information derived from the surface and deep structure of the language and discriminating visual features of the words. The reader samples the visual features of the words and eliminates alternative responses. Syntax, or surface meaning, serves as a cue to the deep structure of the printed material.

Smith (1971) describes the poor reader as one who is not able to fully use the syntactic and semantic redundancy of the material. S/he may require a maximum of visual information and may find it necessary to obtain meaning from surface structure. This procedure may hinder comprehension and tax the child's short term memory. The competent reader, on the other hand, surveys larger units (e.g., phrases) to obtain meaning. Other investigators support Smith's position that competent readers process information from larger units for information rather than discrete ones (e.g., Bower, 1970).

Similarly, Ryan and Semmel (1969) emphasize the importance of language-processing strategies in beginning and mature reading. They contend that reading can be viewed as a "constructive active process in which the reader uses his cognitive and linguistic knowledge to reproduce a probable utterance from a careful sampling of cues, then matches that prediction for appropriateness" (p. 81). Emphasis is on "conceptual" aspects of

reading more than units or single words.

The role of language processing in reading is described by Neisser (1967). Other aspects of linguistic features, i.e., intonation (pitch, juncture, stress) of clauses and sentences, are stressed by Lefreve (1964).

Although Goodman (1965, 1968, 1972) is placed in the linguistic model category by Williams, his views on reading are similar to those of information-processing theorists. For example, Goodman (1968) says the reading process is a matter of recoding, decoding, and encoding. In recoding, the child merely "re-codes" graphic symbols into aural symbols. This does not mean the child understands or "decodes" the graphic message. Encoding involves grasping meaning while reading orally. If the child is deciphering the materials that s/he reads silently, s/he must decode or obtain meaning and then encode meaning as oral output when asked to read orally.

Goodman (1972) calls reading a psycholinguistic guessing game which uses language cues selected from perceptual input. To read, a child must have language information that is encoded in graphic symbols. Moreover, Goodman (1965, 1968, 1972) designates "cue systems" necessary for the reader to glean meaning from written language. He considers "miscues" in oral reading important to the teacher because they provide information about the child's language skills. Cues may be based on: (a) cues within written words; (b) the flow of the language in terms of operational (function) order, inflection or inflectional agreement, intonation or reference to what comes before or after the word in question; and (c) cues external to the language and the reader such as his/her dialect, experiential and family background (Goodman, 1968). If error analysis of a child's reading miscues is qualitative rather than quantitative, the teacher can use oral reading as a means of assessing the language strategies a child uses while engaged in the reading process.

The Reading Miscue Inventory developed by Burke and Goodman (1972) is one source for a qualitative analysis of a child's miscues and could serve as a framework for the study of learning disabled children and adolescents' cueing systems. Levitt (1972) has conducted research on the qualitative differences of retarded children's reading responses as compared to competent readers. Such research is needed in the field of learning disabilities.

In summary, although many interpretations of the reading process exist, investigators appear to be progressing toward an organized and integrated framework. According to Blanton (1973), future research will require a "commitment on the part of the reading researcher to long periods of investigation on carefully selected issues requiring up to ten years research to unravel" (p.118). He further suggests communication among researchers. This last point should be emphasized. Investigators often adhere to outmoded interpretations of the reading process. Furthermore, they have not expressed much interest in the syndromes of dyslexia and the minimally brain damaged. They view these labels as confusing and as adding little to the development of instructional strategies (Lerner, 1975). Because of the distinctiveness of the two fields, practitioners of both disciplines have ignored large bodies of research that may benefit those children and adolescents identified as "disabled readers."

Assessment in Reading

Investigators attempting to describe the reading attainment level and reading characteristics of learning disabled adolescents and children have many norm-inferenced instruments from which to choose. Most of these standardized group and individual diagnostic tests are designed for the elementary grades, although many are available on the secondary level as

well. (See Maurogenes et al., 1974 for a comprehensive list and description of reading tests on the secondary level.) Many reading tests, including those described by Maurogenes et al. (1974), are criticized for their lack of validity and reliability for all levels of achievement (Lennon, 1967; Farr & Tuinman, 1972; Samuels, 1973). Others are criticized for not accounting for the guess factors (Fry, 1971) and not correlating with other reading tests. As a result, the diagnosis varies depending on the test administered (Froesce, 1971). Moreover, a majority of these tests adhere to a taxonomic model of reading; therefore, the researcher reports the word recognition level, the oral and silent reading level, listening comprehension, phonetic analysis, and measurement of reading rate rather than such more important information as strategies the child uses while reading.

Furthermore, in identifying children with learning disabilities, reading scores are used to determine learning quotients or reading expectancies. Many formulae have been developed to determine the child's reading expectancy. However, the main criticism here is that the amount of reading retardation depends upon the formula or procedure used (Reed, 1970; Simmons & Shapiro, 1968). A child may thus be classified "learning disabled" in one study but not another.

Recently, reading educators have developed criterion-referenced tests to assess reading skills. Such tests are the outgrowth of a behavioristic task analytic approach to reading skills which emphasizes specific educational tasks (Bateman, 1966, 1967; Prescott, 1971). Criterion-referenced tests do more than measure global skills as general reading level (Johnson & Kress, 1971). Because they require specificity, careful analysis of tasks is necessary. However, criterion-referenced testing is not without

flaws. According to Prescott (1971) one important assumption of criterion-referenced assessment is that the skills to be measured can be placed in a hierarchy. This assumption creates a problem in reading because there is no clear empirical evidence that one uses a progression in learning to read.

Although criterion-referenced testing is more absolute than standardized tests (which measure a child's ability only in relation to that of another child), they still require a "base of reference" (Prescott, 1971, p. 350). The decision to place a test at a certain level implies a certain expected response from the child -- a response judged upon some criterion considered "typical" for a certain age or capacity. Hence, norming is still involved.

Although criterion-referenced testing has limitations, it holds promise for the development of instructional strategies for learning disabled and retarded children (Gillespie & Johnson, 1974; Proger & Mann, 1973). If adopted, this approach to reading assessment will necessitate a great deal of planning and preparation (Proger & Mann, 1973).

In conclusion, the problems concerning lack of reliability and validity of assessment instruments confound results of the reading characteristics of learning disabled children and adolescents. Recent developments in criterion-referenced testing may prove more promising than reading assessment based on norm-referenced measures.

## Reading Characteristics of the Learning Disabled Adolescent

Clinical observations. Many researchers of learning disabilities cite reading as a problem for learning disabled children and adolescents. Reading disabilities have been included in the specific learning problems of special groups of adolscents, particularly the juvenile delinquent (Duling et al., 1970; Kline, 1972; Tarnopol, 1970). Much evidence of the exact nature of the reading problem has been presented in vague clinical

evidence rather than empirical data. Case studies of the learning disabled are presented in most of the literature.

Critchley (1964) describes dyslexia as a "specific syndrome wherein particular difficulty exists in learning the conventional meaning of verbal symbols, and of associating the sound with symbol in appropriate fashions" (p. 18). He attributes the inability to read to a higher order deficit in cognitive processing. In presenting empirical and clinical evidence concerning the reading characteristics of dyslexics he cites a study by Bachmann (1927) which found the reading rate of dyslexics significantly slower (1 to 6 times) than that of normal readers.

Critchley also presents an extensive classification of oral reading errors of dyslexics: inability to pronounce a word; wild guessing; auditory discrimination of the sounds of letters and words; problems in keeping place while reading; vocalizing while reading silently; incorrect pronunciation of vowels and consonants; and reversals--saw for was. Other anomalies described are seeing letters in isolation with no association of sound and symbol, such as a Capital X described as a sawing-trestle.

Similar clinical findings are described by Boder (1970). Normal children may possess such characteristics, she says, but children with specific dyslexia commit them more often and long after the time they have become uncommon in normal readers. Critchley describes older dyslexics who have at least somewhat overcome their reading disability. However, he concludes that if left unassisted many would become functional illiterates.

In 1937, Orton termed severe reading problems as "developmental alexia" --- congenital word blindness, streposymbolia, specific reading disability (p. 69). He further described clinical cases as developmental alexia. A summary of characteristics found in both older dyslexics and young children is as follows: inability to recognize words at sight compared to normal

readers; a wide range of letter confusions; reversals (saw-was); poor association between letter and sound; omissions of small words which may change the meaning of the test; and auditory discrimination difficulties. Those adolescents who had a history of severe reading disability were unable to gain meaning from long sentences or paragraphs. Orton (1937) describes the silent and oral reading problems of adolescents:

> The real reading in such cases is apt to be a jerky, word by word procedure with very little emphasis demanded by major and dependent clauses, giving the impression that while each unit of the longer phrases and sentences is grasped, the grammatical sequence and hence comprehension are far from facile. These children complain of the time required to cover reading assignments with understanding and of the frequent need of rereading or even of more or less analyzing their required reading before being able to comprehend it thoroughly (p. 92-93).

(See Bryant, 1969, Gallagher, 1969, for supporting studies.)

Other clinical manifestations of reading difficulties of the adolescent learning disabled have been found:

(1) lack of basic sight vocabulary and phonic recognition (Rabinovitch, 1962);

(2) inability to process material sequentially via the auditory channel and lack of adequate mnemonic or automatic memory (Isom, 1969);

(3) incomplete memory of the letters of the alphabet (Carner, 1969);

(4) inability to recall specific words in oral reading and to visualize objects, words, or letters (Johnson & Myklebust, 1965, 1967);

(5) difficulty in internal design and visual spatial patterns (deHirsch, 1963).

Selected Studies. The literature holds little empirical evidence of reading characteristics of the learning disabled adolescent. Many clinicians have observed reading characteristics in clinical settings rather than considering the significant differences between learning disabled readers and normal readers. As stated previously, many of the studies suffer from problems of design, measures used, criteria for identification, and so forth.

Because of the heterogenity of the children included in the studies, caution must be taken in drawing conclusions concerning specific reading characteristics.

A myriad of studies concerning the characteristics of children labeled poor readers exist in the literature. In the few studies conducted on children and adolescents labeled learning disabled, children are generally labeled dyslexic rather than learning disabled. A selected series of these studies is presented here.

1. Johnson and Myklebust

The descriptive study of Johnson and Myklebust (1965) investigates the reading characteristics of sixty 7 to 18 year old dyslexics who were referred to the Institute for Language Disorders because of school difficulties. The researchers define dyslexia as part of a basic language disability more than a reading disorder. Children and adolescents who either exhibited primary aphasic symptoms or were slow learners were not included in the study. Twenty-four subjects were adolescents. No control group was used. The mean intelligence quotient on the WISC of the WAIS was 103.9. The range was 89 to 129. Reading grades for oral reading, reading vocabulary, and comprehension were obtained. Calculated reading quotients were substantially below average compared to the intelligence quotients.

Other tests administered were: the Detroit Test of Learning Aptitude and informal measure of memory; left-right orientation, body-image, and body concept, spelling measures laterally, the EEG, and neurological examination. As a group, the dyslexics, including the adolescents, had memory impairments as defined by the digit span sub-test of the WISC and WAIS, the memory subtests of the Detroit Test of Learning Aptitude, and

such informal measures as repeating in sequence the months of the year and the alphabet. Mental age scores, determined by drawing a human figure on the Goodenough Draw-a-Man Test, were below the chronological and mental age levels. Problems appeared with numerical symbols and positive funding of neurological dysfunction (90% of the cases). Parenthetically, abnormal EEG reading of dyslexic readers has been found by Ayres and Tarres (1967), Liberson (1966), Vogel and Brovermann (1964); however, the evidence that learning disability and dyslexic readers have abnormal EEG's is not conclusive (Hartledge & Green, 1973; Koppitz, 1971).

In the Johnson and Myklebust study, the nature of the reading difficulties was presented case by case. Johnson and Myklebust observed such problems as auditorizing while reading, inability to distinguish differences in letter sounds of syllables, and difficulties in sound blending. They categorize three types of dyslexic readers: (1) visual dyslexics who have problems in discrimination of words and retaining visual images; (2) auditory dyslexics who have adequate visual skills but have problems with auditory discrimination blending and auditory memory; and (3) those dyslexics who have difficulty integrating auditory and visual stimuli.

2. Boder, 1970, 1971

Boder uses three similar characterizations of reading disorders. In studying dyslexics from 8 to 18, she notes three types of reading problems:

(1) dysphonetic, with the primary deficit in letter sound integration and the inability to develop phonetic skills. Spellings are non-phonetic and unintelligible. Substitutions in reading include use of funny for laugh, airplane for train;

(2) dyseidetic with primary deficit in the ability to perceive whole words as gestalts (Boder, 1970, p. 289). Reading is by phonetics rather than by sight;

(3) combination of both dysphonetic and dyseidetic. Boder describes this category as the most serious reading disorder.

C. Naidoo 1972

He divided his 98 specific dyslexic boys, aged 8-13 into the reading retarded and the spelling retarded. A control group of 98 boys matched for age, types of school, and class background was used.

Naidoo defines dyslexia as "a condition causing difficulty in learning to read and spell in physically normal intelligent children in spite of continuous schooling and in the absence of severe emotional problems" (p. 24).

Naidoo found the dyslexic boys were reading at least two years below their chronological age. The control group was reading at grade level or advance of their chronological age. (This finding is not surprising since Naidoo's boys at the Word Blind Center had already been identified as having severe reading problems.) Scores from standardized word recognition and reading comprehension tests were obtained. Significant differences were found in reading accuracy, rate, word recognition and reading comprehension as measured by these tests. Sound blending of the reading retardates as measured by an informal test was found significantly below that of the control group. The majority of the dyslexic boys could blend sounds at age 11; most of the controls, at 8 years of age.

D. Myklebust 1973

Myklebust (1973) incorporated adolescents and developmental sequences of reading achievement in his study. Although the children were not labeled dyslexic or learning disabled, they had been classified by the schools as reading disabled and were in remedial reading classes. A control group was selected from the same schools. Age ranges were divided into groups with two year intervals: 7, 9, 11, 13, and 15 years. Children below age 8 were not found in remedial reading classes, and the majority of the children were between the ages of 11 and 13.

The 15-year-olds were inferior to the control groups on such factors as cognitive ability, as measured by the Primary Mental Abilities Test and the Draw-a-Man Test. Children who had reading disabilities scored lowest on the subtests requiring verbal ability, but scores were about 90 IQ on several of the nonverbal tasks. As compared to the normal children, the reading disability children generally scored lower as they became older. Myklebust attributes this to an inability to achieve at the normal rate not to reading potential. Frequently this is reflected as a negative correlation between age and reading scores (p. 64).

Developmental patterns were the same for both groups - a plateau at 13 years of age - on auditory receptive language. However, poor readers achieved a level of function at 13 years; normal readers, at 9 years.

Test II matched what was heard to the printed page. Rate of gain at the two year interval exceeded that of controls, and by age 15, rate corresponded to the normals. Yet, at 15 years, the ability of the reading disabled to comprehend instruction auditorially and to relate it to reading was that of an 11-year-old normal reader. The reading disabled group was from three to four years below the average in auditory reception.

On auditory expression, the reading disabled were three to four years below normal on the ability to give opposites. Fifteen-year-olds had obtained a level of auditory expressive language equivalent to that of a nine-year-old. They were also deficient in the definition of words and reached a plateau in this skill at age 13.

Eleven and 13-year-olds scored half of the average on word recognition as measured by the Columbia Vocabulary Test. Fifteen-year-olds were one-third the average. The reading disabled did not make expected gains as they grew older. Myklebust concludes:

> Their inferiority is revealed further in that at 15 years of age their capability was at third-to-fourth grade level. Characteristic of children with reading disability, they did not make the expected gains as they became older. It is not uncommon to find poor readers who evidence greater retardation year by year. Nevertheless, this group showed advancement from 11 to 13, but at a rate below that of the control group. They made no gains from 13 to 15 years, whereas the normals advance rapidly during this age. (p. 69)

Follow-up studies of learning disabled readers

A. Herjanic and Penick 1972

Myklebust's observations of the reading gains of disabled readers has been observed by other special educators. However, the prognosis for learning disabled readers is not clearly established. Herjanic and Penick (p. 397) review the "history of childhood reading disorders" and note that few studies have been conducted to determine the long term effects of reading retardation. Further, they criticize the few available studies for their small numbers and disregard for IQ, race, SES, and emotional problems. The authors conclude that the results vary to the extent that no definitive conclusions can be drawn as to the achievement patterns of adult dyslexics. (See Herjanic & Penick, 1972, for a thorough summary of the studies which include follow-up of students labeled dyslexic.)

B. Koppitz 1971

Koppitz conducted a follow-up study of learning disabled children ranging in age from 11 to 18 years. The youngsters had been enrolled in a public school learning disabilities program, although the follow-up does not continue into the learning disabled subjects' adult life, it is still valuable because of its implications for placement and programming for such children. The children entered the program during a four year span and when possible were studied for five years following admission. The entire study covers a period of eight years.

Koppitz defines a learning disabled child as one whose "school achievement is more than one year below his mental age, cannot profit from attendance in a regular public school class despite normal intellectual potential and a lack of gross motor impairment (p. 1). The term did not indicate any specific underlying etiology. However, Koppitz concludes that observed learning problems were primarily due to some degree of "brain dysfunction."

In summary, Koppitz concludes that before a learning disabled child nine years or older can succeed in a regular class s/he should be able to read at least at the fourth or fifth grade level. She states:

> The findings of the follow-up study convinced me that a child who is still reading at the preprimer or primer level at age 10 or 11 will not become a fluent reader by the age 16. Chances are he will never progress far beyond the second or third grade reading level, if that far (p. 192).

She found that learning disabled pupils who were returned to regular classes were from the beginning better readers than the long-term learning disabled. In addition to reading achievement, she concludes that: (1) the learning disabled children exhibited varying degrees of learning and behavior disorders; (2) learning disabled children were referred to the learning disabilities program more often for behavior problems than for reading problems; (3) older learning disabled children had reported soft neurological signs when they were younger, but these seemed to disappear as they got older; (4) overall EEG's did not show abnormalities; and (5) those learning disabled children who were able to profit from regular class had parents who were "interested, cooperative, and supportive." Those who did not profit from learning disabled classes or who were referred for residential treatment came from unstable or deprived homes on the whole.

C. Muehl and Forell 1973

Muehl and Forell conducted a follow-up study of disabled readers who had been referred to a reading clinic five years before. They classify the poor readers according to their performance on the EEG, designating three groups: (1) normal EEG's; (2) abnormal EEG's with 14 and 6 per second positive spike pattern (PSP) (related to severe behavior disorders and lack of impulse control by some investigators, e.g., Freeman, 1971); and (3) abnormal EEG's other than the 14 and 6 PSP. after five years, no significant relationship was found between EEG findings and reading achievement, although the reading performance of the abnormal EEG's than the 14 and 6 PSP tended to be better than the other two groups.

The Ss took both the Iowa Tests of Educational Development (ITED) and reading tests dealing with materials in social studies, natural sciences, and literature. Results of the reading tests: (1) Only two of the subjects had reading scores above the 15th percentile; (2) five students had dropped out of high school (four of whom were described as having severe reading retardation);(3) twelve were in college. Muehl and Forell conclude that poor readers in the elementary and junior high, as a group, continue to be poor readers in high school. The better group of readers in their study had higher IQ's, were younger when first referred for remedial reading, had spent more time in clinical instruction, and had parents who were professionals or white collar workers who sought help earlier for their children.

Similarily, other follow-up studies of dyslexics have concluded that specific reading retardation tends to be a persistent handicap (Rutter & Yule, 1973).

Summary of clinical and empirical evidence

The clinical manisfestations and studies presented are representative of most studies dealing with the reading characteristics of the learning disabled (dyslexic, minimal brain dysfunction, and so forth). Many of the design problems quoted by Samuels (1973) and Satz and Sparrow (1970) are apparent. In most cases, learning disabled children possess reading difficulties. The exact nature of these difficulties is not clear at present.

Most studies adhere to a taxonomic model of reading which yields little more than reading level and a few oral reading errors. Studies emulating the investigations conducted by Gibson (1970), Goodman (1972) and Levitt (1972) may provide more information about the reading process in all children. Researchers in the field of learning disabilities could profit by using language processing of reading acquisition in designing their studies.

Instructional Strategies in Reading for the Learning Disabled

Special educators have assumed that children designated dyslexic, minimally brain injured or learning disabled need differential programming to learn to read. Many remedial reading programs have been developed for such special populations. (See **Bannatyne, 1968; Fernald, 1943; Fitzhugh & Fitzhugh, 1966; Gillingham & Stillman, 1965; Heckelman, 1969; Hegge, Kirk, & Kirk, 1955; Hillis, 1971.**)

Other programs used with learning disabled children are: (1) Distar (Engelmann & **Bruner, 1969; (2) Words in Color (Gattegno, 1962); (3) programmed readers (Buchannon & Sullivan Associates, 1963 & Behavioral Research Laboratories, 1966);** (4) readers not employing traditional orthography, such as the Peabody Rebus Reading Program (Woodcock & **Clark, 1969) and**

the Initial Reading Alphabet (ITA) (Downing, 1967);(5) such special approaches as language experience approach (Lee & Allen, 1963), organic reading (Ashton-Warner, 1963), and linguistic readers (Merril Linguistic Readers, (Fries et al, 1966). Howard (1969) characterized corrective reading programs used with young and adolescent dyslexics as those with large doses of isolated letter phonics and exercises in perceptual motor development and tactive kinesthetic exercises.

Some educators note that methods used with learning disabled children appear no different than those used with normal readers or other retarded readers (Lerner, 1969). The present authors have observed that while instruction in reading for learning disabled children includes instruction in word recognition and comprehension, it differs from typical remedial reader practices. More instruction appears in the area of the reading correlates (see earlier sections of this paper) such as language, usually based upon the ITPA or Peabody Language Development Kits (Dunn & Smith, 1965, 1966, 1967; Dunn, Harton, & Smith, 1968), perceptual-motor skills based upon Kephart's program (Kephart, 1971), visual perceptual training (as in the Frostig, Horne Program in Visual Perception; Frostig & Horne, 1964), and auditory perception programs such as the Auditory Discrimination in Depth (ADD) (Lindamood & Lindamood, 1971). Although these programs are typically used with younger children, they are also used in remedial programs for adolescents, especially the perceptual-motor training exercise (Howard, 1969).

Such training assumes that the relationships between these skills and reading is causal and that enhancement in these areas will increase reading achievement. However, the relationship between training in these areas and reading achievement has not been clearly established (Allen, Dickman, &

Haught, 1966; Balow, 1971; Black, 1974; Buckland & Balow, 1973; Gillespie & Johnson, 1974; Hammill, Goodman, & Wiederholt, 1974; Hammill & Larson, 1974; Hammill & Wiederholt, 1973; Keough, 1974; Samuels, 1973; Sedlack & Weener, 1973).

Moreover, the assumption that special populations read differently or require differential reading instruction from other retarded readers, or from normal readers has not been clearly established (Gillespie & Johnson, 1974; Reed, Mankinen, & Rabe, 1971). Orlando (1973) states the research is inconclusive and negligible. Reed, Rabe, and Mankinen (1971), in reviewing the effectiveness of reading instruction for brain injured children, conclude that there is little evidence to suggest that teaching procedures for these children should differ significantly from other children who possess reading problems. Further, the research literature offers little to support the superiority of one method of teaching reading over another (Blanton, Sitko, & Gillespie, in press; Bond & Dysktra, 1967; Cawley, Goodstein, & Burrow, 1973; Gillespie & Johnson, 1974).

Generally, gain-score studies have been used to determine the superiority of one method over another in teaching children with similar characteristics. Designs are used in which deficits are presumed for an entire group of children, and special and traditional programs are compared (Ysseldyke, 1973, p. 10). According to Ysseldyke (p. 19), this type of research has been criticized for various reasons: a failure to consider the Hawthorne effect, inadquate controls, regression effects, linerarity across different levels and lack of reliability among diagnostic devices. Such research assumes homogeneity among the populations, and this has not been found among learning disabled children. In addition, this approach does not necessarily provide information that will be beneficial to the

teacher since it is difficult to define how one approach is truly different from another. (Most methods contain such similar elements as the teaching of the alphabet, comprehension, structural analysis, or word recognition.) Moreover, comparison studies do not reveal the strong or weak points of a particular program (Engelmann, 1967).

Some developers of instructional strategies for learning disabled children emphasize teaching to the strengths (Johnson & Myklebust, 1967). Others stress teaching toward the weaknesses (Bannatyne, 1971). Multisensory training (Fernald, 1943; Gillingham & Stillman, 1965) is advocated by some clinicians, as is training toward intact modalities. Johnson and Myklebust (1967), in particular, contend that some learning disabled children can be overloaded with too much stimuli if multisensory techniques are used.

Currently the efficacy of modality training, with normal and poor readers ( designating children as visual, auditory or tactile-kinesthetic learners and then teaching toward the preferred modality) has been reviewed ( Blanton, 1971; Morrissey & Myers, in preparation; Waugh, 1973). The results of these reviews indicate a lack of evidence for the efficiency of modality preference training. Morrissey and Myers note that many of the studies dealing with modality training use diagnostic procedure for determining modality preference that have questionable validity.

For a thorough discussion of reading approaches that have been used with learning disabled students, including ones stressing modality preference, see Myers and Hammill (1969), Gearheart (1973), and Gillespie and Johnson (1974).

Diagnostic-prescriptive approaches to reading. Recognizing that special classes of children possess inter- and intra-individual differences (Kirk & Kirk, 1971), an attempt has been made to develop techniques based on the

most effective strategies for "specific variables believed to be related to academic learning" (Ysseldyke & Salvia, 1974). However, in a review of diagnostic-prescriptive training programs, (Ysseldyke, 1973; Ysseldyke & Salvia, 1974) little empirical support was found for the diagnostic-prescriptive approach.

According to Ysseldyke (1973) the use of correlational and gain-score results to determine differential instruction is an inadequate technique. He states that aptitude treatment research is appropriate in investigations of diagnostic-prescriptive programs, but concludes, "that very little research in special education has employed aptitude-treatment interaction designs" (p. 28). Those studies that have used the method have failed to demonstrate significant treatment interactions. Reasons for some of the failure to demonstrate significant treatment interactions between personological variables and instructional strategies include lack of valid, reliable, and educationally relevant instruments.

Ysseldyke and Salvia (1974) note that effective diagnostic-prescriptive teaching depends on four critical assumptions:

(1) Children enter a teaching situation with strengths and weaknesses.
(2) These strengths and weaknesses can be reliably and validly assessed.
(3) These strengths and weaknesses are causally related to the acquisition of skills.
(4) There are well identified links between child's strengths and weaknesses and the relative effectiveness of the instruction (p. 181).

Ysseldyke and Salvia question the empirical support for all four underlying assumptions in education of handicapped children. (These assumptions are discussed elsewhere in this paper.) Such reading programs for the learning disabled are based upon the skills measured in the ITPA and the DTVP.

Task analysis. Ysseldyke and Salvia describe the task analysis model of instruction as a model which places emphasis "on observed inter- and

intra-individual differences in skill development. Assessment of strengths and weaknesses within this model is restricted to evaluation of the child's position on skill continuance. Emphasis is placed on the child's current level of skill development, the next skill to be mastered, and the behavioral components of that next skill" (p. 182).

According to Lerner (1975) task analysis in the field of learning disabilities is used to determine the processing abilities required of the individual. On the other hand, she states that task analysis in reading involves analysis of the task itself.

If this is the case, problems occur within both approaches she describes. First, the underlying processes necessary for reading achievement have not been clearly established. For example, a learning disabilities specialist may conduct a task analysis of visual perceptual tasks to train areas that have not been established as ones that will directly enhance reading achievement. Second, a hierarachy of reading progression and necessary subtasks needed for competence in reading remains to be clearly demonstrated. Many task analyses of reading skills tend to be in areas that reflect taxonomical models of reading instruction (word recognition, phonetic approach, and structural analysis skills). Such an approach may encourage training in isolated word attack skills simply because they are the easiest to analyze according to subtasks with a certain amount of face validity, e.g., word recognition, phonetic analyses.

Perhaps more extensive investigations of the reading process will enable educators to develop adequate task analytic approaches which can transfer more readily into instructional strategies.

## Reading Instruction Geared Specifically to the Adolescent Learning Disabled

Most of the literature dealing with learning disabilities emphasizes

early identification and intervention. However, many children identified for remedial instruction relatively early continue to exhibit reading difficulties in the secondary schools. According to Wepman et al. (1975), intervention for learning disabled children over age 12 should be compensatory rather than developmental. The learning disabled adolescent should be taught to utilize his/her best skills to meet the academic requirements of the secondary school.

Recently, more attention has focused on programming basic skills for learning disabled adolescents and adults (Bailey, 1975; Giles, 1975; Goodman, 1975). Suggestions include use of high interest-low vocabulary materials, development of study skills, and presentation of content through a variety of methods such as films and cassette tapes on the secondary and college level.

As interest in developing reading strategies for the adolescent learning disabled increases, we fear the promulgation of materials and programs that have not been carefully validated with adolescents. The adoption or adaptation of assessment techniques and instructional strategies that has had questionable efficacy with younger learning disabled children is no answer to meeting the needs of older children who have reading problems. More analysis of both reading characteristics of the learning disabled adolescent and the requirements of the secondary curricula is needed before programming can be truly effective.

Conclusions

The conclusions of the preceding review of the research concerning the reading difficulties of the adolescent learning disabled are as follows:

(1) Ascribing specific reading characteristics to adolescents classified as learning disabled is difficult because of the nature of the populations used in clinical and empirical evidence. A variety of interpretations of learning disabilities, dyslexia, minimal brain damage and so forth exist. Because of definitional confusions and varying identification procedures, heterogeneity exists from group to group designated as learning disabled.

(2) The reading process has been defined differently by those researchers in reading and the other disciplines. Reading research in learning disabilities reflects these various interpretations. Most past research depicts a simplistic view of the reading process. Most of the investigations have dealt with reading correlates rather than the reading process per se.

(3) Assessment techniques in reading, for the most part, lack validity, reliability, and true diagnostic value. Quantitative rather than qualitative differences are most often measured by these tests.

(4) Clinical and empirical data indicate that "learning disabled adolescents" possess similar reading characteristics as younger children with learning disabilities. Difficulties in basic sight vocabulary, reading comprehension, rate of reading, auditory and visual discrimination difficulties, and sequencing of letters are examples of these difficulties.

(5) Few follow-up studies have been conducted concerning the long term effect of reading programming for learning disabled children or the problems accrued by adolescents and adults with reading disorders. Those

studies that have been conducted indicate reading problems tend to persist into adolescence and adult life. In addition, the younger the child at the time of intervention, the more successful the programming, and the less severe the reading problem(s), the more chance for success in the secondary program or regular class.

(6) Reading programming is more developed on the elementary level. Recently attention has focused on the reading and learning problems of the adolescent learning disabled. Moreover, those special and regular educators who are developing effective instructional strategies on the secondary level are faced with the critical issue of the lack of carefully validated programming developed for younger learning disabled from which to generalize.

Implications

Two critical issues should be addressed in programming for those adolescents designated learning disabled. First, more research should focus on the current theories in the field of reading. The lack of specificity of the research describing the reading characteristics of normal and inadequate readers is apparent. Most often, because of the utilization of a taxonomic model of reading, investigators who have studied the characteristics of poor readers have reported only reading levels and a few clinical observations of oral reading errors. More studies dealing with involvement of linguistic and information processing skills in the reading process should be conducted.

Most promising is the research conducted by Levitt (1972), Blanton (1974), and Bilsky and Evans (1970) with poor readers in exceptional populations. Research conducted by Goodman (1965, 1968, 1972), Venezky and Calfee (1970), Smith (1971), Elkind et al. (1965), and Gibson (1970) seems to have promise

for research in determining reading characteristics of the learning disabled adolescents.

If educators are to consider the individual reading needs of learning disabled children and adolescents, a re-orientation in research methodology, programming, and teaching training must occur. Rather than attempting to isloate or ameliorate various deficits using generic intervention programs, it seems more feasible to conduct task analyses of childrens' behaviors in learning to read. Most often, reading approaches used in classes for the learning disabled employ phonics and/or whole word approaches which consider the word as the basic unit of reading. These methods neither attend to the communicative nature of reading, nor do they address themselves to the relevance of linguistic context, particularly to semantic and syntactic relationships in sentence structure in determining both word perception and comprehension. It is necessary for reading investigators to develop training techniques which enhance the ability of learning disabled children and/or adolescents to efficiently attend to and utilize relevant linguistic strategies which take advantage of the basic structures of the materials themselves.

Second, children and adolescents classified learning disabled tend to exhibit a wide range of abilities and disabilities. The heterogeneity of a supposedly homogenous population has been cited countless times in the literature. Although researchers may be able to identify learning disabled children and adolescents with similar clusters of characteristics (McCarthy, 1975), the development of instructional programming necessitates focusing on the individual and situation-specific assessment rather than merely determining general clusters of behavior. While particular reading difficulties may be remediated by specific instructional strategies, this may not be the

case with every adolescent possessing that particular reading characteristic. Motivational factors, the influence of previous instruction, and the nature of the course content will influence the efficacy of the intervention.

Because of the many variables involved in establishing programs for adolescent learning disabled, we suggest using a decision making model for programming (Gillespie & Sitko, 1974, 1975). Major stages of the model are assessment, implementation, and evaluation. In assessment the teacher establishes the instructional needs of the child by gathering data from a variety of sources, i.e., pupil records, information from resource personnel, and in situ. The information gathered from the classroom setting should have the most importance in terms of establishing instructional objectives for the child. In planning a program for the adolescent, the teacher must conduct a task analysis of the reading materials and/or strategies available and a learner analysis of the adolescent. There should be a match between the cognitive demands of the approach and the learning characteristics of the child. All programs established should consider as much data as possible including the teacher's preferred teaching style and the influence characteristics of other children in the classroom. Instructional needs should be considered tentative by the teacher. Diagnostic teaching lessons should serve as trial lessons. Data gathering should continue during this process. All instruction should be part of assessment; hence, lessons are part of the continual and ongoing assessment of instructional needs. Evaluation should be in terms of effectiveness of the teacher and the gains of the pupil. The teacher needs to evaluate his/her effectiveness in implementing and monitoring instructional programs. Concise objectives for the child and/or adolescent are equally important in evaluating the progress of the child and/or adolescent.

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